**IRM-AT Calibration Experiment**

Hypothesis/Plan:

* From datasheet, sensor should output 2 – 4 mV in normal air and typically a 5% should be observed in 2.5% CH4.
* Currently, analogue voltage reading from sensor at 5 V reference gives a reading of 15 – 30 out of 1023. This gives a range of 73 – 146 mV. From the oscilloscope, the output signal has a peak-to-peak amplitude of ~600 mV, with a peak ~400 mV and a trough ~200 mV.
* From data sheet and considering practical values, a drop in signal of <10 mV should be observed for low levels of CH4.
* To produce CH4, easily digestible food waste like fruit peels, vegetable scraps and sugary foods will be chopped/blended then mixed with pre-made compost to encourage rapid decomposition. This mixture with water will be placed in an airtight container with heating pads stuck on to maintain 30 – 40 °C, again, to encourage rapid decomposition. A rubber tube will then be drilled into the container flowing to a bag which will have the device. The change in CH4 readings over time will be recorded and trends observed. An estimate of the CH4 level at each time period will be used to scale the sensor’s response.

**PID-AH Calibration Experiment**

Hypothesis/Plan

* From data sheet: sensor’s sensing range is 0 – 40 ppm. Sensor sensitivity = 55 mV/ppm. This equates to an analogue voltage reading of 11.3 for every ppm.
* To test it a perfume (usually 70 – 90% ethanol) will be sprayed onto a bowl and an exact amount of it (probably 1ml) will be sampled and placed in a 1 l container to control its concentration. Keeping the temperature constant, the sample should evaporate in minutes then the gas inside the container can be funnelled to the PID-AH sensor to check its reaction, allowing for calibration.